

## Studi karakteristik Beton Ringan Cangkang Kelapa Sawit dengan Menggunakan Bahan Tambah 5% Fly Ash dan Variasi Superplasticizer = Study Characteristics Of Lightweight Concrete Using Oil Palm Shell With Addition Of 5% Fly Ash And Superplasticizer Variation

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### Abstrak

Perkembangan teknologi beton terus mengalami peningkatan seiring dengan meningkatkan penggunaan material beton dalam dunia konstruksi di Inonesia. Oleh karena itu, diperlukan suatu inovasi dalam teknologi beton untuk mengatasi permasalahan ketersediaan bahan-bahan penyusun beton. Indonesia merupakan salah satu negara penghasil minyak kelapa sawit terbesar di dunia. Cangkang kelapa sawit merupakan salah satu limbah dalam industri kelapa sawit yang dapat dimanfaatkan kembali menjadi bahan penyusun beton.

Penelitian ini membahas mengenai beton ringan dengan agregat kasar berupa cangkang kelapa sawit dengan penggunaan bahan tambah 5 fly ash dan variasi Superplasticizer sebesar 1 , 1.1 , 1.2 dan 1.3 . Pengujian yang dilakukan meliputi pengujian kuat tekan, kuat lentur, modulus elastisitas, daya serap air, dan susut beton. Beton ringan cangkang kelapa sawit dengan kuat tekan dan kuat lentur terbesar terdapat pada variasi campuran 5 silica fume dan 1.1 Superplasticizer. Beton ringan cangkang kelapa sawit dengan modulus elastistas dan susut terbesar serta daya serap air terkecil terdapat pada beton dengan variasi campuran 5 silica fume dan 1 Superplasticizer.

*The development of Indonesia 39 s infrastructure in many islands is significantly increase through the years. Based on this condition, the natural resource mining of concrete materials is over exploited and becoming rare slowly, so the demand of alternative materials become urgent. The Oil Palm Shell OPS can achieve environmentally sustainable structures, but to optimize it as structural concrete, using additives is necessary.*

This paper investigated the effects of Superplasticizer and fly ash proportion to lightweight concrete characteristics, which are compressive strength, flexure strength and also modulus of elasticity. The study did extra treatments for OPS to be coarse aggregates and used 4 types of mix proportions, from 1 , 1.1 , 1.2 , 1.3 of superplasticizer together with 5 fly ash. It was found that OPS lightweight concrete using this type of additives have compressive strength up to 21.58 MPa in 28 days, flexural strength up to 2.54 MPa, and modulus of elasticity up to 13274.64 MPa. This study shows that using 5 fly ash and 1.1 Superplasticizer effectively increasing concrete behaviour better. In general, OPS lightweight concrete with 5 fly ash and variation of superplasticizer are applicable and ready to being produced as green structural lightweight concrete alternative in Indonesia.